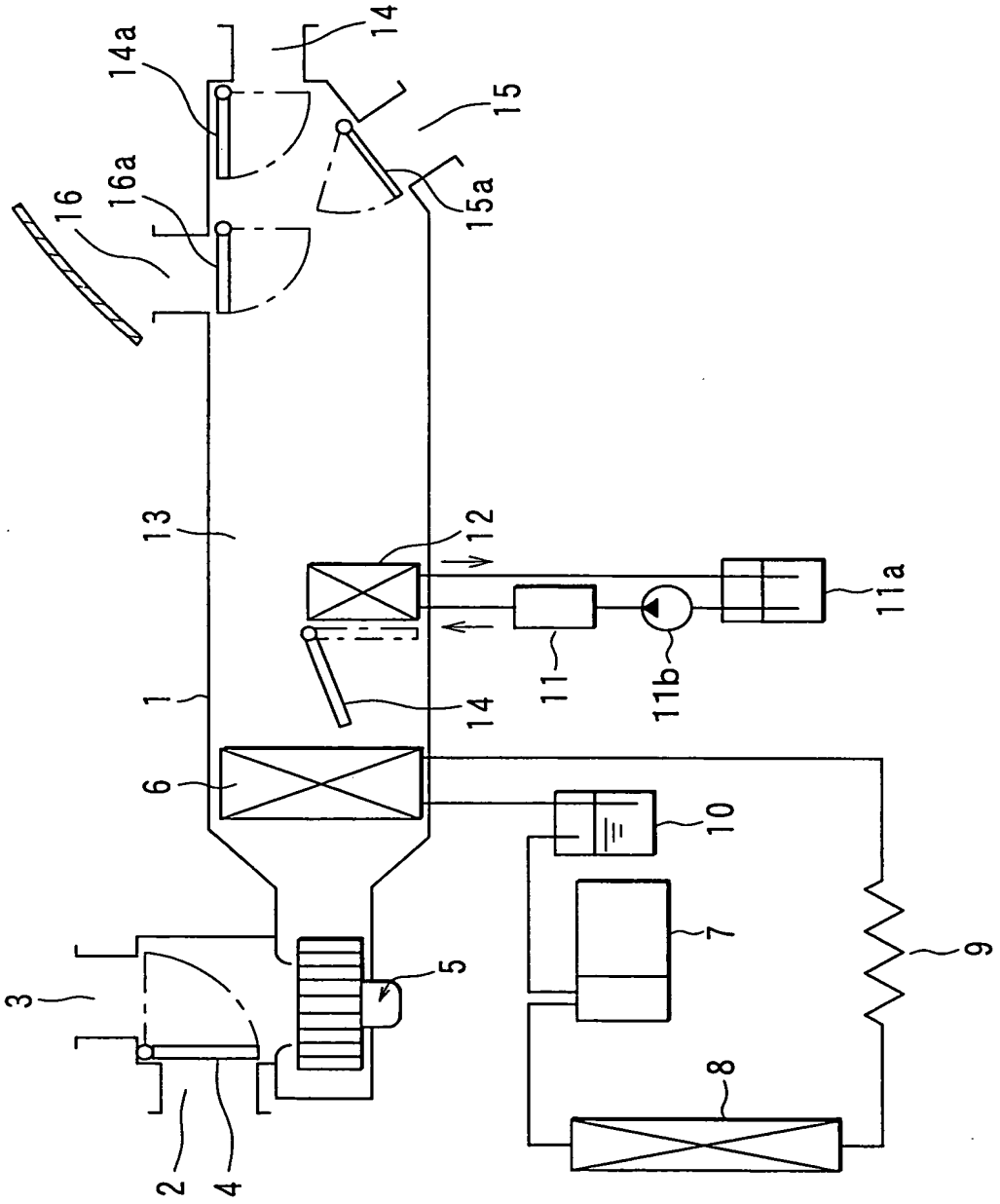
FIG. 1



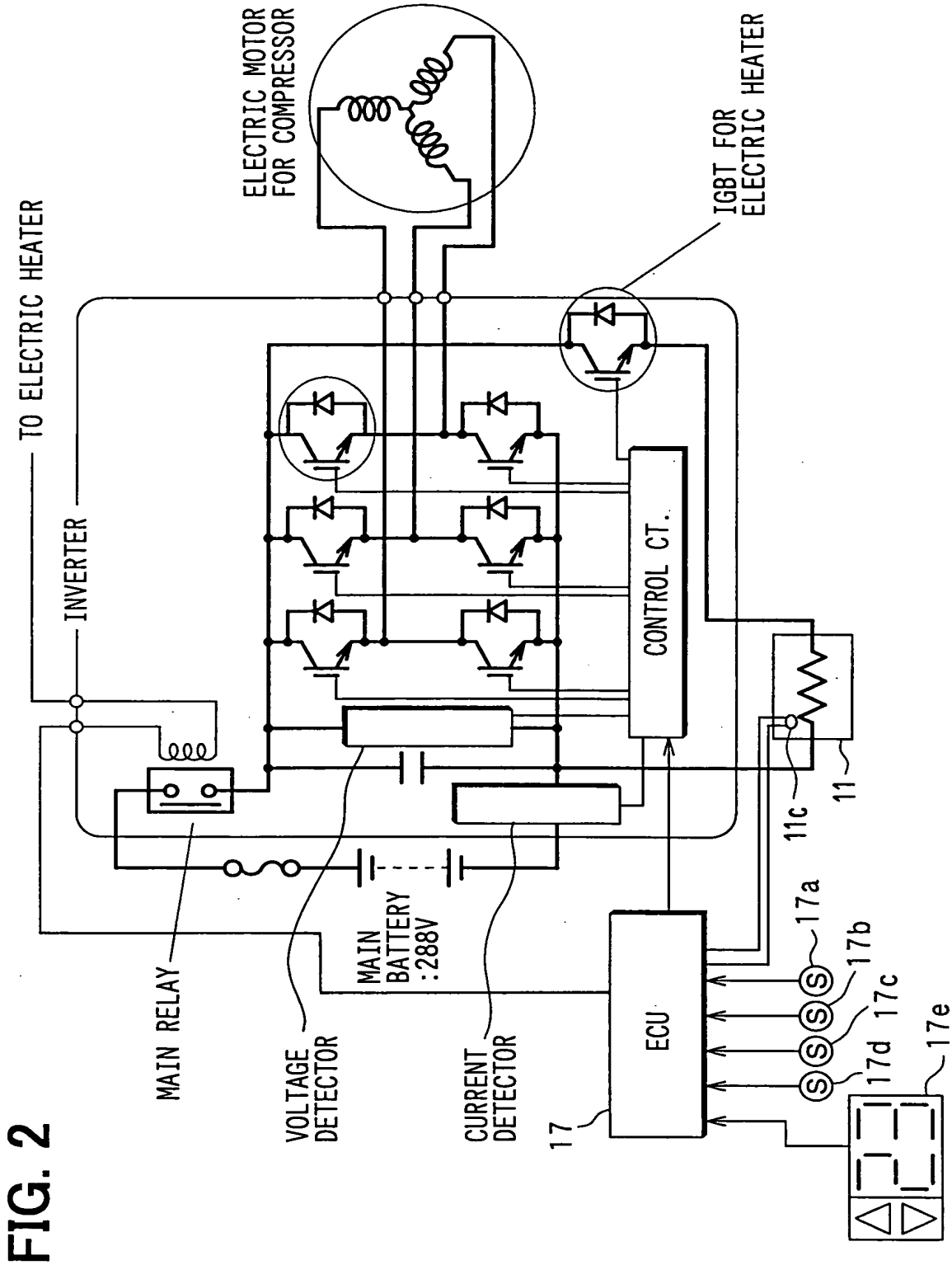

ELECTRIC MOTOR FOR COMPRESSOR
IGBT FOR ELECTRIC HEATER
TO ELECTRIC HEATER
INVERTER
CONTROL CT.
11
11c
MAIN RELAY
VOLTAGE DETECTOR
MAIN BATTERY :288V
CURRENT DETECTOR
ECU
17
17a
17b
17c
17d
17e

FIG. 2

FIG. 3

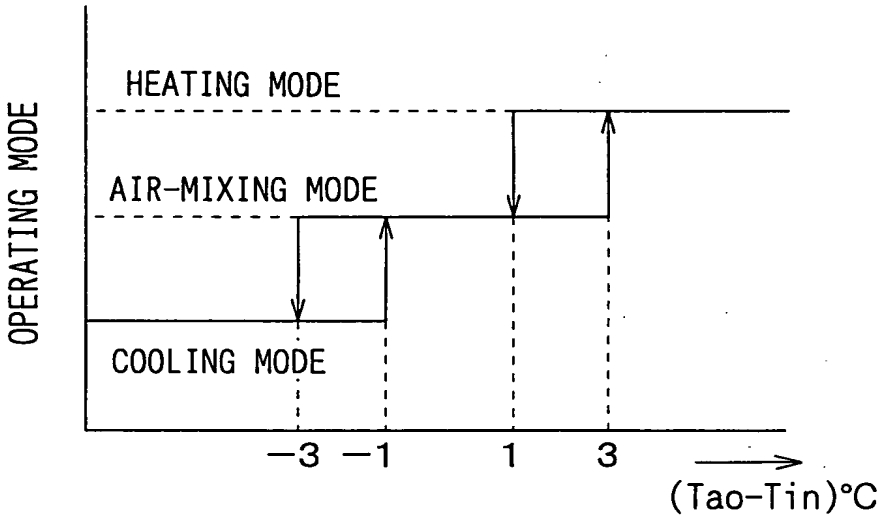

HEATING MODE
AIR-MIXING MODE
COOLING MODE
OPERATING MODE
−3
−1
1
3
(Tao-Tin)°C

FIG. 4

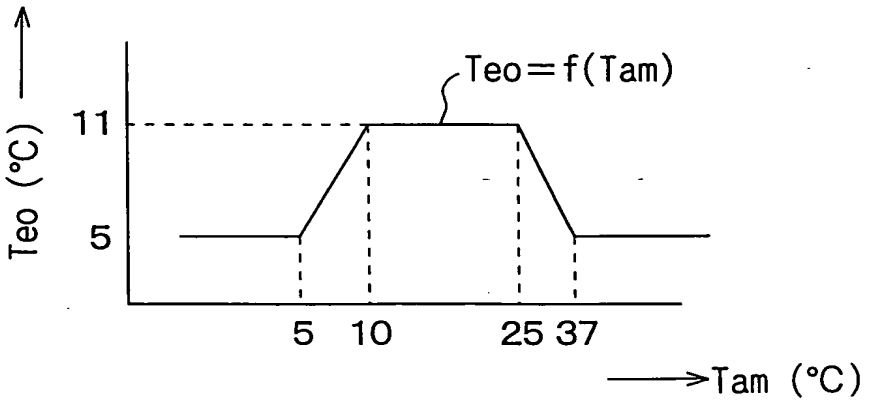

Teo=f(Tam)
11
5
Teo (°C)
5
10
25
37
Tam (°C)

FIG. 5

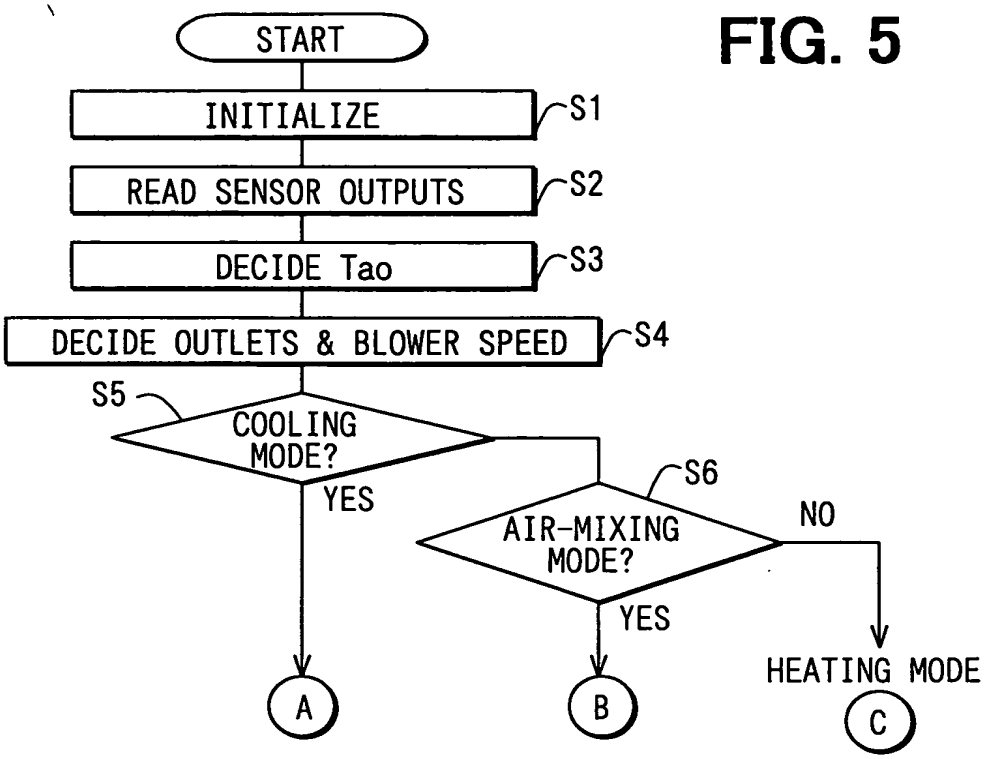

START
INITIALIZE
S1
READ SENSOR OUTPUTS
S2
DECIDE Tao
S3
DECIDE OUTLETS & BLOWER SPEED
S4
S5
COOLING MODE?
YES
S6
AIR-MIXING MODE?
NO
YES
HEATING MODE
A
B
C

FIG. 6

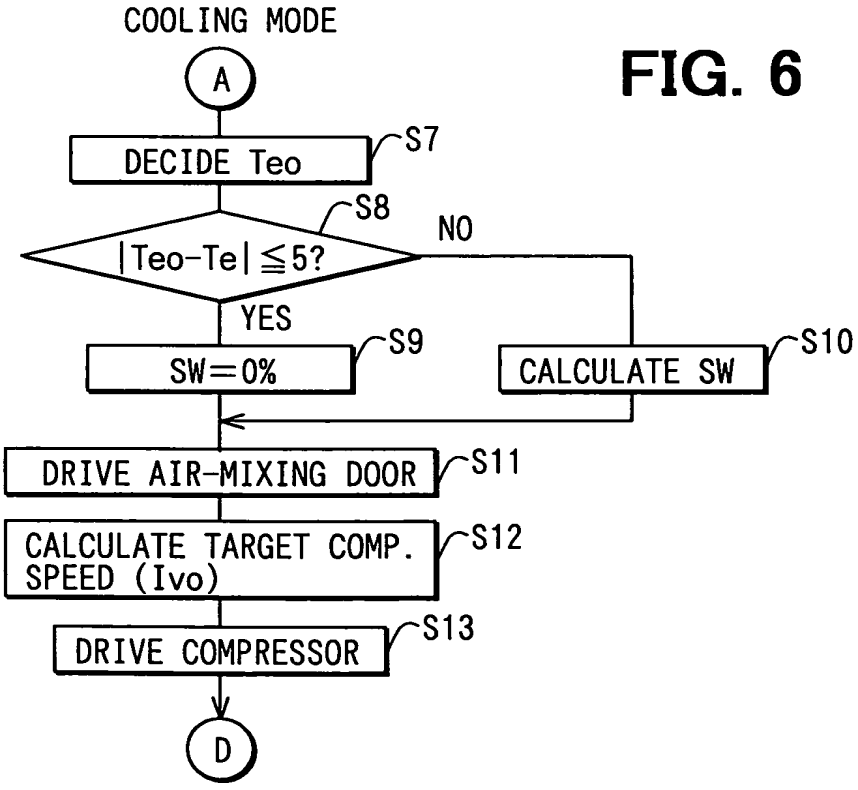

COOLING MODE
A
DECIDE Teo
S7
S8
|Teo-Te| ≦5?
NO
YES
SW=0%
S9
CALCULATE SW
S10
DRIVE AIR-MIXING DOOR
S11
CALCULATE TARGET COMP. SPEED (Ivo)
S12
DRIVE COMPRESSOR
S13
D

FIG. 7

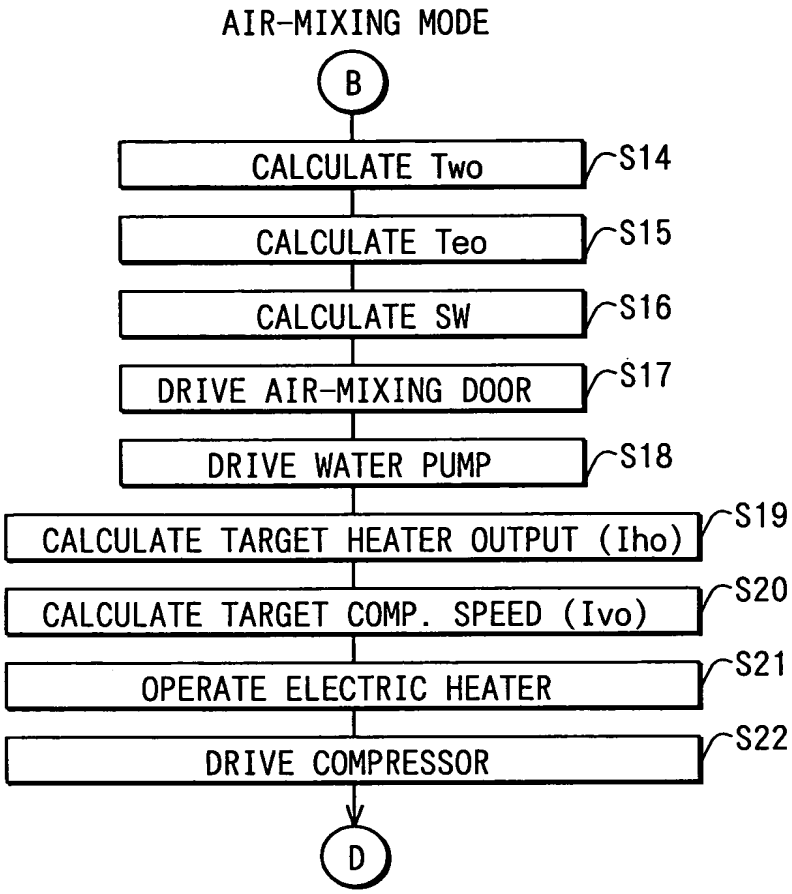

AIR-MIXING MODE
B
CALCULATE Two
S14
CALCULATE Teo
S15
CALCULATE SW
S16
DRIVE AIR-MIXING DOOR
S17
DRIVE WATER PUMP
S18
CALCULATE TARGET HEATER OUTPUT (Iho)
S19
CALCULATE TARGET COMP. SPEED (Ivo)
S20
OPERATE ELECTRIC HEATER
S21
DRIVE COMPRESSOR
S22
D

FIG. 8

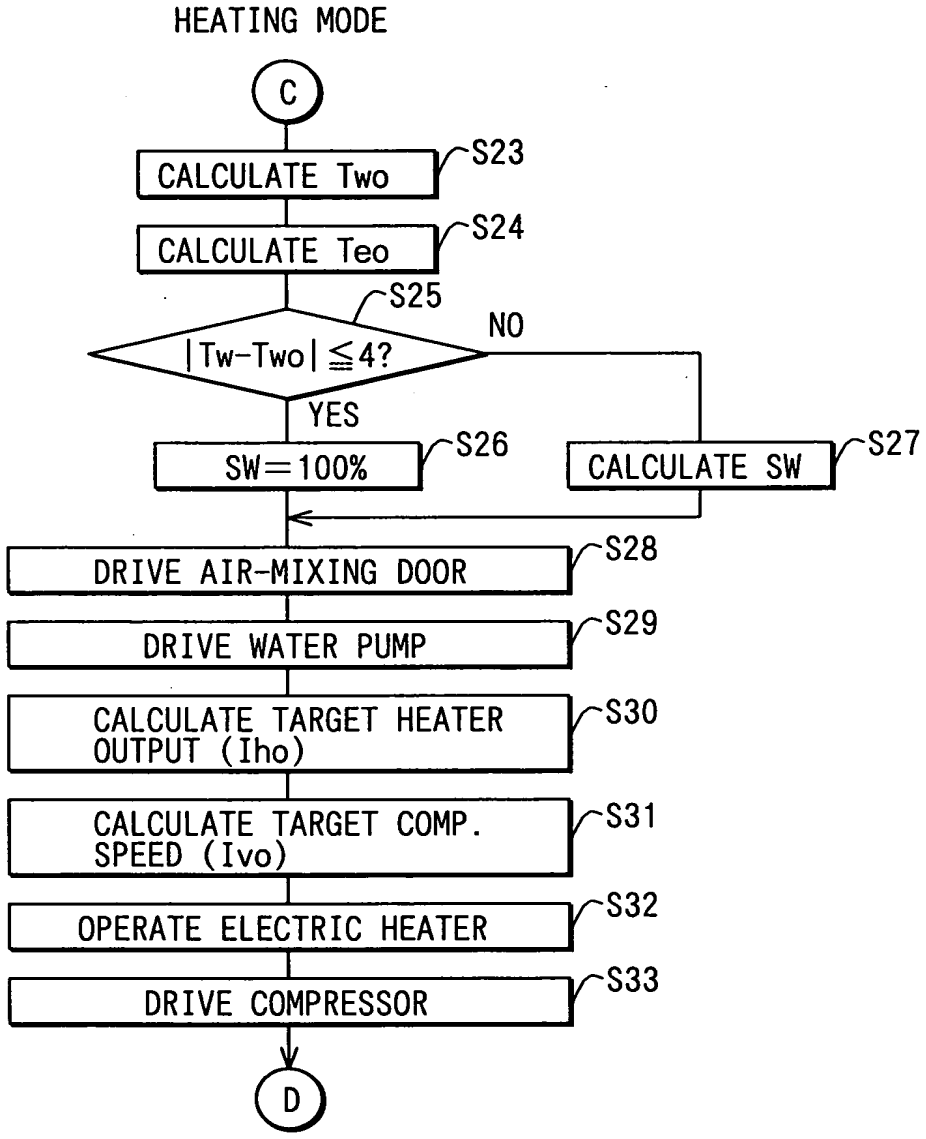

HEATING MODE
C
CALCULATE Two
S23
CALCULATE Teo
S24
S25
|Tw-Two| ≦4?
NO
YES
SW=100%
S26
CALCULATE SW
S27
DRIVE AIR-MIXING DOOR
S28
DRIVE WATER PUMP
S29
CALCULATE TARGET HEATER OUTPUT (Iho)
S30
CALCULATE TARGET COMP. SPEED (Ivo)
S31
OPERATE ELECTRIC HEATER
S32
DRIVE COMPRESSOR
S33
D

FIG. 9

	COOLING MODE	AIR-MIXING MODE	HEATING MODE
Teo	Teo=Tao	f(Tam)	f(Tam)
Two		Two=50°C OR CALCULATED TARGET (WHICHEVER HIGHER)	$Two=\frac{Tao-Te}{\phi}+Te$
SW	SW=0%	$SW=\frac{Tao-Te}{Tw-Te}\times 100\%$	SW=100%
WATER PUMP	OFF	ON	ON

FIG. 10A

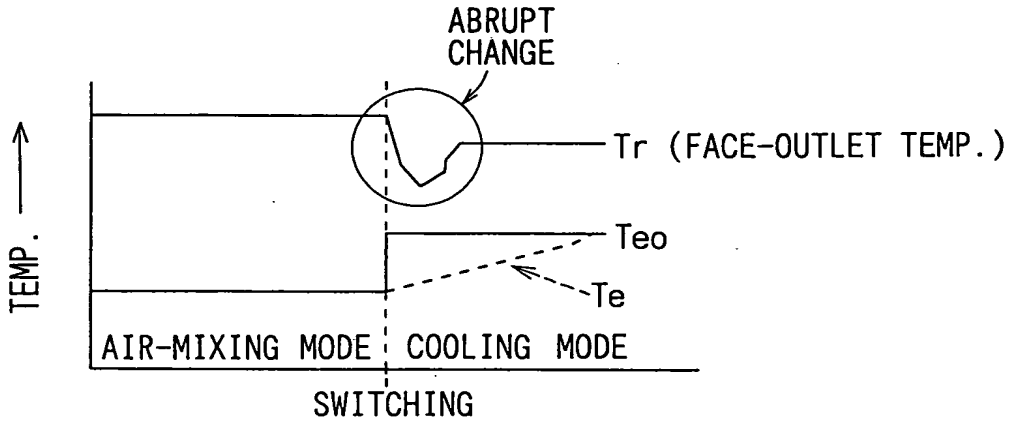


FIG. 10B

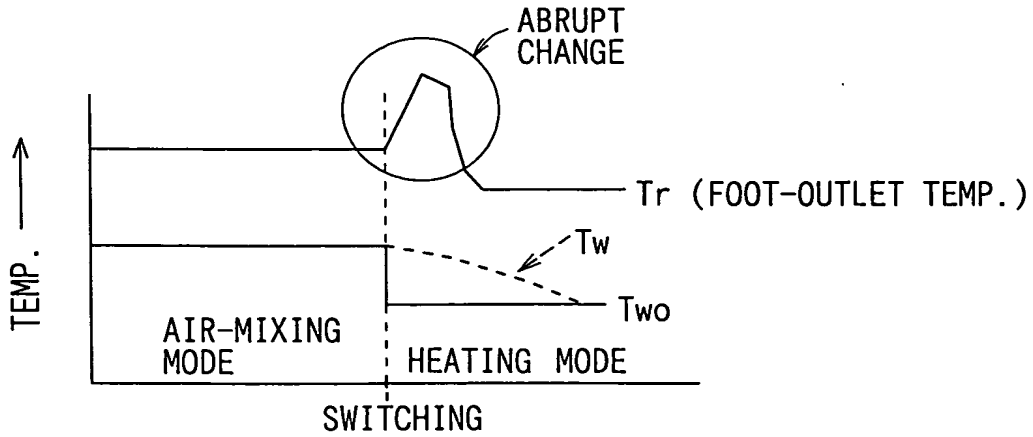


FIG. 11

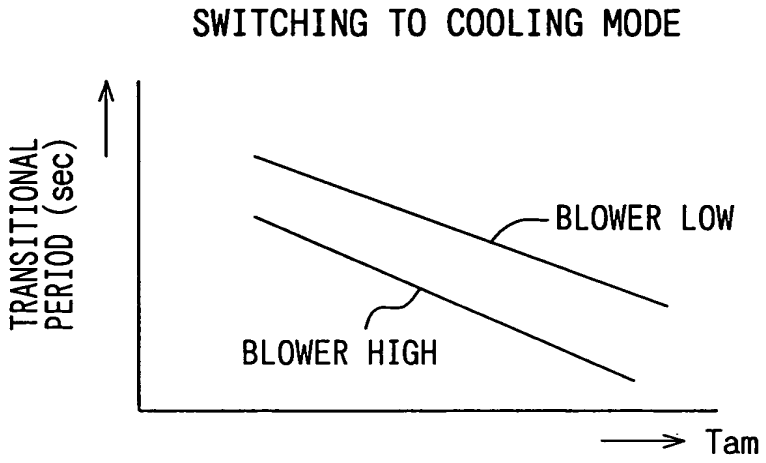
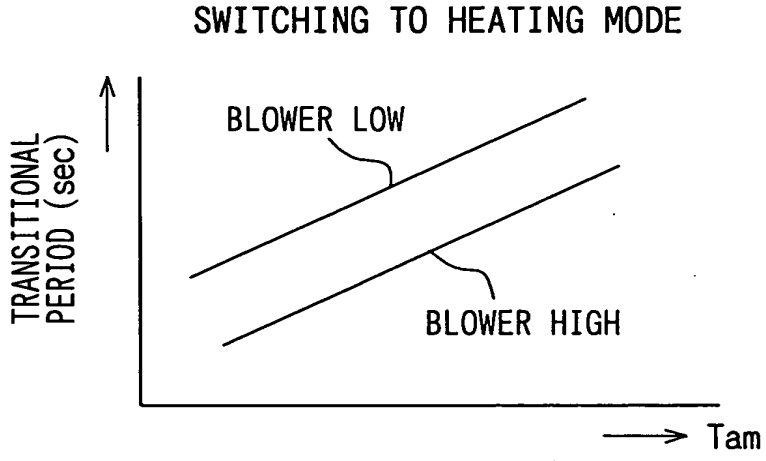

SWITCHING TO COOLING MODE
TRANSITIONAL PERIOD (sec)
BLOWER LOW
BLOWER HIGH
Tam

FIG. 12


SWITCHING TO HEATING MODE
TRANSITIONAL PERIOD (sec)
BLOWER LOW
BLOWER HIGH
Tam

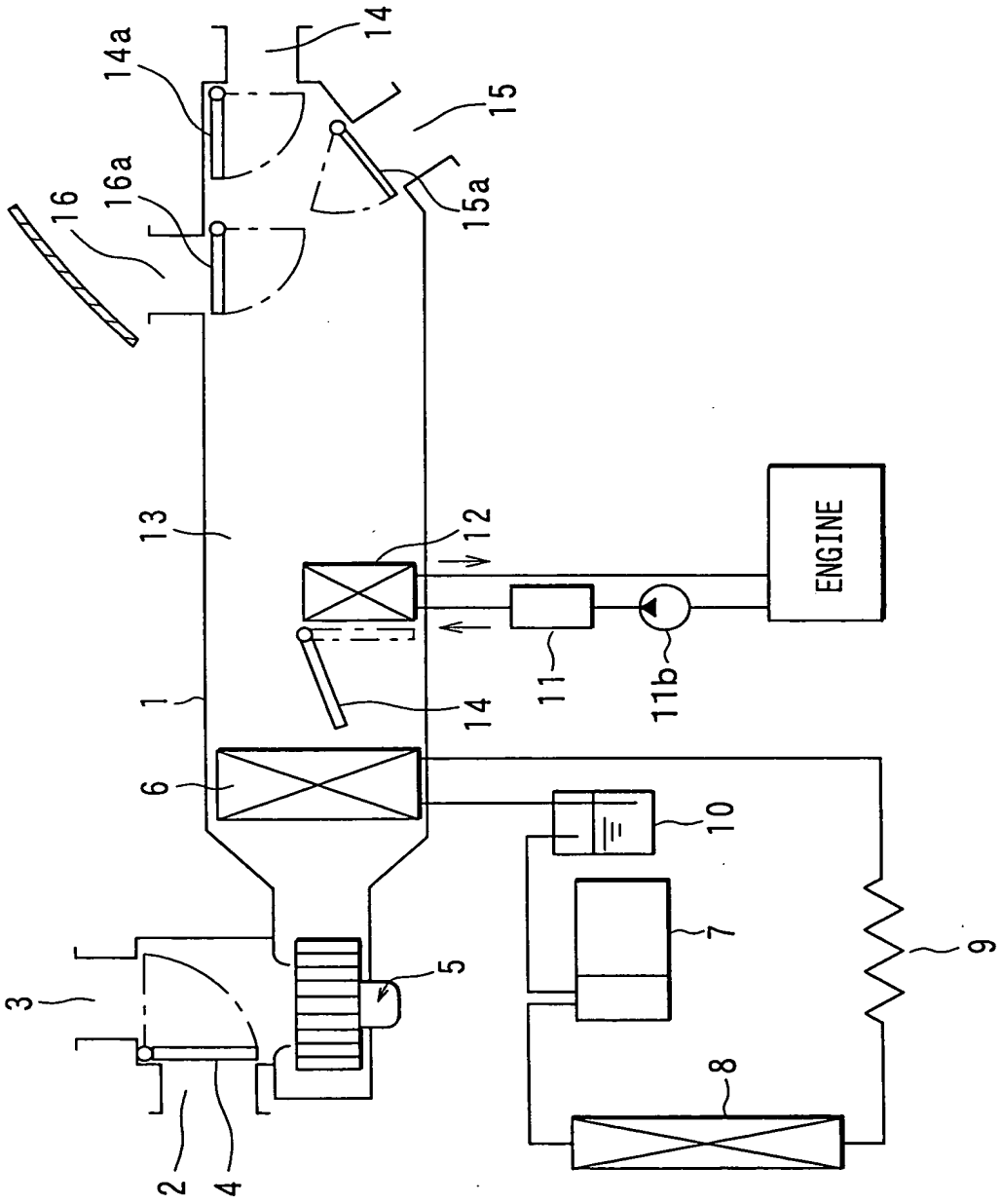


FIG. 13